NASA Procedural Requirements

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Subject: NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping w/Change 5 (03/15/2010)

Responsible Office: Office of Safety and Mission Assurance

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Chapter 2. Readiness to Conduct Investigations

2.1 Headquarters Operations and Center Mishap Preparedness and Contingency Plan

2.1.1 The ED/OHO and each CD shall develop a Center Mishap Preparedness and Contingency Plan that describes the following:

a. The local mishap and close call notification, reporting, investigating, recording, and prevention policies and procedures (Requirement 44358).

b. The relationship between the emergency preparedness plan, the Center Mishap Preparedness and Contingency Plan, and Program Mishap Preparedness and Contingency Plans and which plan takes precedence given specific conditions (Requirement 31273).

c. Management responsibilities for establishing mishap investigations (Requirement 31274).

d. Procedures to appoint an IRT for those mishaps and close calls that are not covered by a program/project Mishap Preparedness and Contingency Plan (i.e., facility mishaps and close calls) (Requirement 31275).

e. Procedures to appoint a MIT or MI for Type C mishaps, Type D mishaps, and close calls that occur at the Center or involve programs/projects/activities managed by the

Center (Requirement 31276).

f. Roles and responsibilities of the incident commander (or the location in the emergency preparedness plan where these can be found) (Requirement 31277).

g. Procedures to impound appropriate records and equipment that may be involved in the mishap to prevent unauthorized use or modification (Requirement 31278).

h. List of responsible organizations, along with Center safety office personnel, that shall take immediate action to safeguard (or impound) appropriate records, equipment, and facilities and secure the mishap site (Requirement 31279).

i. Identification of the location or space where impounded data, records, and equipment shall be stored and secured during an investigation (Requirement 31280).

j. Procedures for release of impounded data, records, equipment, facilities, and the mishap site (Requirement 31281).

k. Mishap report approval process for Type C mishaps, Type D mishaps, and close calls that occur at the Center or involve programs/projects/activities managed by the Center (Requirement 31282).

l. List of potential contractor support and onsite experts that can facilitate the immediate acquisition or purchase of products needed by the investigation board or team (e.g., high resolution cameras, recording devices, software, and others) (Requirement 31283).

m. The mandatory schedule for mishap simulations that include simulation of accident investigation procedures as described in this NPR, the Center Mishap Preparedness and Contingency Plan, and the Program Mishap Preparedness and Contingency Plan (Requirement 31284).

n. The information technology plan to provide computer data retrieval and data archive support to the investigating authority (Requirement 31286).

o. Requisite security clearances, if any, for investigating authority members, chair, and ex officio (Requirement 31287).

p. Description of the "chain of custody process" that will be used to secure and safeguard personnel effects and sensitive information related to injured or deceased individuals (Requirement).

> *Note: This process includes the procedures to provide physical security over and controlled access to personal effects and other sensitive material.*

q. The expiration date (Requirement).

> *Note: Depending on the Center personnel turnover and realignments, the Center Mishap Preparedness and Contingency Plan, including the contact list may need to be updated semiannually or quarterly.*

r. The appropriate steps to be taken in advance to ensure that assigned IRT and potential MIB members have authority and resources (including, but not limited to, travel, contractual authority, and salaries) to expeditiously deploy to the mishap scene, effectively preserve mishap evidence, interview witnesses, and conduct an orderly investigation without administrative delay.

Note 1: NPR 9250.1 requires that the acquisition or fabrication of equipment that meets NASA's capitalization criteria have a unique WBS assigned and that the costs of the acquisition or fabrication be reported in a separate reporting category on 533 reportable contracts. Note 2: NPR 7120.5D, NASA Space Flight Program and Project Management Requirements states that the purpose of a WBS is to divide the project into manageable pieces of work to facilitate planning and control of cost, schedule, and technical content. WBS is a product-oriented division of project tasks that depicts the breakdown of work scope for work authorization, tracking, and reporting purposes as it relates to traceability and provides a control framework for management.

2.1.2 The ED/OHO and each CD shall, without causing administrative delay to IRT or early MIB activities, ensure that mishap investigation costs are assigned to appropriate institutional, programmatic or tenant organizations based on their accountability for the mishap-related activity.

2.2 Program and Project Mishap Preparedness and Contingency Plans

2.2.1 The program/project manager shall concur in a Program/Project Mishap Preparedness and Contingency Plan that:

a. Is a comprehensive plan for all mishaps and close calls that occur offsite, at offsite program/project (as defined by NPR 7120.5) contractor sites, or in flight.

b. Is consistent with the Centers' Mishap Preparedness and Contingency Plans, for all Centers in which the program operates (Requirement 31290).

c. Covers any information and procedures required specifically by the program that are not covered in the Centers' Mishap Preparedness and Contingency Plans (i.e., special procedures for safing, handling, or containing hazardous chemicals present in the program's/project's hardware) (Requirement 31291).

d. Describes the procedures to comply with NPR 8621.1 notification, reporting, investigating, and recording requirements for all program/project activities not located at a Center or managed by a Center (e.g., program/project activities managed by Headquarters and located at a University, contractor site, or other off-Center location) (Requirement 31292).

e. Describes the training requirements and the IRT's membership for mishaps and close calls that occur offsite, at offsite program/project (as defined by NPR 7120.5) contractor sites, or in flight (Requirement 31293).

f. Describes any special procedures for the emergency response personnel, the IRT, and the incident commander that are not covered in the Center Mishap Preparedness and Contingency Plan or the emergency response plan (e.g., identification and handling of hazardous commodities specific to the program) (Requirement 31294).

g. Describes the procedures to impound data, records, equipment, facilities, and property not located at a NASA facility (Requirement 31295).

h. Identifies existing memoranda of agreement with national, state, and local

organizations and agencies that may be utilized during a mishap investigation (Requirement 31297).

i. Describes how offsite debris shall be collected, transported, and stored (Requirement 31298).

j. Describes the investigation and debris collection process required for any mishap or close call occurring in a foreign country (Requirement 31299).

k. Requires that, for NASA-investigated mishaps, NASA personnel shall perform and control the impounding process (Requirement 31300).

l. Lists the personnel who will assist in performing the procedures to impound data, records, equipment, facilities, and other property (Requirement 31301).

> *Note: Contractor personnel may provide data from their offices and/or facilities to the NASA personnel performing this task.*

m. Identifies the national, state, and local (and, where applicable, international) organizations and agencies which are most likely to take part in debris collection; identifies the roles and responsibilities of each organization; and identifies a point of contact (Requirement 31296).

n. Addresses the responsibilities and procedures for mishap investigation in the bilateral or multilateral agreements when the program involves international partners, program managers, and project managers (Requirement 31302).

o. Describes the resources that may be needed from other government agencies (e.g., Federal Emergency Management Agency, NTSB, DoD, Department of Justice) during a Type A mishap or Type B mishap investigation; identifies the point of contact and contact information for each of these Agencies; describes the procedures to acquire their assistance; and identifies the potential roles and responsibilities of each Agency (Requirement 31303).

p. Includes a list of information such as databases, Web sites, documentation (including hardware history), drawings, basic system operation, and procedures that may be scrutinized in a Type A mishap involving loss of a vehicle and/or major facility damage and frequently updates this information so that it is easily deliverable to a mishap investigation board, and includes points of contact for the information. (Requirement 31304).

q. Describes the information technology plan to provide computer data retrieval and data archive support to the investigating authority (Requirement 31306).

r. Describes the requisite security clearances, if any, for investigating authority members, chair, and ex officio participating in program/project investigations (Requirement 31307).

s. Describes the "chain of custody process" that will be used to secure and safeguard personal effects and sensitive information related to injured or deceased individuals (Requirement).

> *Note: This process includes the procedures to provide physical security over and controlled access to personal effects and other sensitive material.*

t. Names of key personnel from the Agency Public Affairs Office and Office of External

Relations (OER) that should be notified for all Type A and Type B mishaps (Requirement).

u. States the expiration date (Requirement).

> *Note: Depending on the Program personnel turnover and phase (e.g., test, processing, and flight), the Program/Project Mishap Preparedness and Contingency Plan, including the contact list may need to be updated semiannually or quarterly.*

v. Describes appropriate steps to be taken in advance to ensure that assigned IRT and potential MIB members have authority and resources (including, but not limited to, travel, contractual authority, and salaries) to expeditiously deploy to the mishap scene, effectively preserve mishap evidence, interview witnesses and conduct an orderly investigation without administrative delay.

> *Note 1: NPR 9250.1 requires that the acquisition or fabrication of equipment that meets NASA's capitalization criteria have a unique WBS assigned and that the costs of the acquisition or fabrication be reported in a separate reporting category on 533 reportable contracts. Note 2: NPR 7120.5D, NASA Space Flight Program and Project Management Requirements states that the purpose of a WBS is to divide the project into manageable pieces of work to facilitate planning and control of cost, schedule, and technical content. WBS is a product-oriented division of project tasks that depicts the breakdown of work scope for work authorization, tracking, and reporting purposes as it relates to traceability and provides a control framework for management.*

2.2.2 The program/project manager shall have the appropriate NASA Offices, at a minimum, General Counsel, OPA, OER, and Centers (all Centers at which the program/project has activities) review and comment on the Mishap Preparedness and Contingency Plan prior to its approval (Requirement 31308).

2.2.3 The program manager (or designee) shall provide the Program Mishap Preparedness and Contingency Plan to OSMA/SARD for posting on the NASA Mishap Investigation Web site prior to the Safety and Mission Success Review (SMSR).

2.2.4 Reserved.

2.2.5 The program or project (as defined per NPR 7120.5) Safety and Mission Assurance representative shall review and approve the Mishap Preparedness and Contingency Plan, verifying that it has the content required per this NPR (NPR 8621.1), prior to submittal for signature (Requirement).

2.2.6 The program manager shall, without causing administrative delay to IRT or early MIB activities, ensure that mishap investigation costs are assigned to appropriate institutional, programmatic, or tenant organizations based on their accountability for the mishap-related activity.

2.3 Mishap Preparedness and Contingency Plan Practice

2.3.1 The Program and Center Mishap Preparedness and Contingency Plans, including emergency response where appropriate, shall be practiced during contingency

simulations that occur prior to a major test, launch, or space activity (Requirement).

Note: Practice is intended to mean tabletop and/or full enactment simulations (where possible).

2.3.2 For ongoing programs with repeated major test, launches, and space activities, the Program Mishap Preparedness and Contingency Plan, including emergency response where appropriate, shall be conducted at least every 18 months.

2.3.3 The Center Safety Office at the Center where the program is managed shall provide oversight of the Mishap Preparedness and Contingency Plan simulation.

2.3.4 At the conclusion of the simulation, the Center Safety Office and Program shall identify any deficiencies in the Mishap Preparedness and Contingency Plan, update the plan as needed, and/or take other necessary corrective actions to assure that the plan can be effectively implemented if a mishap occurs.

2.4 Contingency Plan Web Site

2.4.1 All MDAAs, Programs, Projects, and Centers shall submit their up-to-date Mishap Preparedness and Contingency Plans to OSMA/SARD for storage on the NASA Process Based Mission Assurance Secure Web Site.

Note: The mishap web site provides a secure central repository that NASA civil servants can use to find the latest versions of the contingency plans.

2.5 Contract Clauses

2.5.1 Contracting officers shall include appropriate mishap and close call notification, reporting, recording, and investigation procedures in NASA contracts (Requirement 31310).

2.5.2 The Center safety office shall involve itself in acquisition strategy meetings per NFS Part 1807, Acquisition Planning, to assure that the appropriate mishap and close call reporting, investigating, and evaluation criteria are incorporated into contracts (Requirement 31311).

2.6 Training

2.6.1 The Chief/OSMA with the support of the Center safety office shall provide the necessary training to ensure that at least one member of each investigating authority and the ex officio has, at a minimum, the following:

a. Knowledge of the NASA mishap investigation policy and process as demonstrated via test (Requirement 31314).

Note: The NASA "Introduction to Mishap" course provides the training to meet this requirement.

b. Knowledge and skills to secure the site; preserve the mishap scene; interview witnesses; collect and impound data, records, equipment and facilities; create time lines; document facts; generate fault trees; perform barrier analysis; perform change analysis;

create event and causal factor trees; obtain forensic analysis; integrate evidence; draw conclusions; generate recommendations; and generate mishap reports (Requirement 31315).

2.6.2 The Chief/OSMA, with the support of the Center safety office, shall provide the necessary training to ensure that the human factors mishap investigator has the following:

a. At a minimum, knowledge (as demonstrated via test or on-the-job training) of the method to identify unsafe acts and errors, identify types of errors, identify causal and contributing factors for errors, identify performance shaping factors, interview witnesses, analyze data, create timelines, perform fault tree analysis, perform barrier analysis, create event and causal factor trees, draw conclusions, and generate recommendations that will reduce human error or mitigate the negative consequence of human actions (Requirement 31317).

b. Basic knowledge of physical and psychological processes, capabilities, skill levels, and limitations of humans, such as the science and practical application of cognitive psychology, human reliability, anthropometrics, biomechanics, and human factors engineering applications to design (Requirement 31318).

2.6.3 The Center safety office shall develop and maintain NASA mishap investigation introductory training (onsite orientation training) that can be provided to the investigating authority and advisors upon their assignment to the investigation (Requirement 31319).

a. The NASA mishap investigation introductory training shall include (at a minimum) a brief familiarization of the investigating authority's roles and responsibilities, NASA policy and procedures, and a description of root cause analysis (Requirement 31320).

2.7 Tools

The Chief/OSMA supported by the Center safety offices shall identify candidate mishap investigation tools that can be implemented quickly and maintain a tool repository that makes these tools readily available to investigating authorities (Requirement 31321).

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